

Plans Preparation Manual Reference



EZ GUIDE

To Assist with
Roadway Design
and Delineation

SECOND EDITION

AUGUST 2001



EZ GUIDE Outline



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EZ Guide Revisions

** Subsequent to issuance of June 2001 edition*

Page 4 - **Text Table** revised.

Page 5 - **Leveling** color chart revised.

Page 7 - **Line Weights** table revised.

Page 12 - **Erosion Control** sheet added to list and **TM** sheet name revised to “Transportation Management Plans, Details and Quantities”.

Pages 22 through 25 - **Abbreviations and Acronyms** revised and General Rules added for clarification.

EZ Guide Purpose



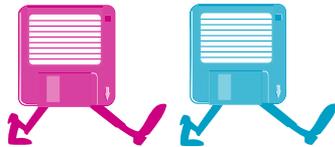
This “EZ Guide” is intended to assist with the initial stages of roadway design of projects.

The information contained herein should be used as a quick reference and is in no way a replacement for the new Plans Preparation Manual or the CADD Users Manual.

This document will help serve project, design and oversight engineers, within Caltrans, to eliminate extra or unnecessary technical delineation by the local support staff. This booklet may also be used by our external partners as a supplemental reference guide.

We hope your use of the “EZ Guide” will help facilitate, streamline and reduce delineation time in the preparation of your project for Plans Specifications and Estimates (PS&E) Submittal.

File Formats



Standard File Format

Caltrans only accepts 100% electronic submittals. The standard file format for submission of PS&E to Division of Engineering Services - Office Engineer (DES-OE), is a MicroStation *design File*... or *.dgn*

The following variations, with prior approval from DES-OE, will also be acceptable for PS&E Submittal, under the specific circumstances listed below:

- (*dgn*) format files with imbedded or imported *raster* data. Pictures imported into the design plane for the purpose of enhancing or emphasizing a detail. This is static data and cannot be altered. Examples are Fire Marshal Seals, existing landmarks, etc.

- **(Tiff) or Tagged Information Format File.** Acceptable where legacy plan sheets are being considered for submission as part of a new CADD Submittal. This is a single, complete plan sheet with borders intact, submitted as a tiff raster image. The legacy sheet is to be scanned, sized (cropped), de-speckled and de-skewed before submittal. The preferred size of the finished Tiff plot is 559 mm x 864 mm (22" x 34") and for special circumstances the maximum allowable size is 584 mm x 889 mm (23" x 35"). These will be raster edited.

Non-Acceptable Formats

- ***Hard Copy Originals***

The following CADD file formats will not be acceptable for PS&E due to the time and effort required to process at DES-OE Project Plans Unit:

- **(Reference Files)** MicroStation *dgn* files containing reference file data. That is any sheet file that requires one or more external files that contain sheet geometry for use as an overlay.

- **(Hybrid or Composite Files)** MicroStation *dgn* files with attached Descartes *HMR* (a specific proprietary image format developed by HMR corporation) images. These are raster images converted to the neutral *HMR* format and referenced to the design plane.

- **(Raster Reference)** Any raster format file (jpg, gif, tiff, cgm) that is attached to the design plane using MicroStations reference attachment tools.

- **(Cadd Generated Raster)** Any file that was created as a *dgn* file, but converted to raster for convenience or expediency, will not be accepted for PS&E Submittal. This includes sheet files from projects previously completed in CADD, but have been moved to archival tape or disk. Recover and use the original CADD files.

- **(AutoCad Files)** Any file started with AutoCad (.dwg or .dxf file) must be imported into a MicroStation file.

Seed Files

A seed file should be considered as a template. When a new file is created, a seed file is necessary to define the type of design file desired, 2d or 3d, Imperial or Metric. The seed file also sets the default settings and defines the working units. The CADD and Engineering GIS Support Branch has issued standard seed files without the coordinates of any of the 9 metric design planes in the California Coordinate System (CCS).

mseed.dgn = 2d Metric Seed File

mseedz.dgn = 3d Metric Seed File



Working Units

There is only **ONE** standard working unit in Roadway Development and Plan Sheet Construction for metric files.

Roadway Metric Plan Development:

master units = meters

sub units = millimeters



Resolution

Sub Units (SU) 1,000 millimeters per meter

Positional Units (PU) 10 Positional units per millimeter

Working Area 429,496 meters square

All 9 design planes have the same size working area, just different coordinates (within the CCS) for the Project Setup (center of any design plane) and Global Origin (lower left corner of any design plane).

Scales

Typical Use	Horizontal Scale
Roadway Urban Areas	1:500 (Base Scale)
Rural Areas	1:1000
Where Greater Detail Required	1:200
Traffic Electrical	1:200

Text

DESCRIPTION	CADD Size*	CADD Font	CADD Weight
Title Project Description	TX=3.7	FT=43	WT=0
Name and I.D. Code of Individual Sheets, does not apply to Title Sheet	TX=3.7**	FT=43	WT=0
Titles for Tables and Detail Drawings	TX=3.0	FT=43	WT=0
City Names on Title Sheet Strip Map	TX=2.5	FT=43	WT=0
Begin and End Work Title Sheet	TX=2.5	FT=2	WT=2
Subtitles for Tables and Detail Drawings. Route and Route No.	TH=2.2 TW=2.2 ***	FT=2	WT=2
River Names	TX=1.8	FT=23	WT=1
Majority of Text, (including text within drawings and tables).	TX=1.8	FT=2	WT=1
Restricted Space for Placement of Text	TH=1.8 TW=1.5	FT=2	WT=0

* - TX represents height (TH) and width (TW) in meters for Caltrans standard 1:500 drawings.

** - Adjustable if necessary (TX=3.0 minimum)

*** - Reduce text width (TW=1.8 minimum), if needed for restricted space, i.e. item headings in quantities summaries.



Leveling

Summary

1	Control Data
2-8,11,12	Topo Map Data
9, 10	Sheet Formats
13-30	Construction Details
31-35	Right of Way
36-60	Data for Specific Type of Plan Sheet
61-62	HQ Changes/As Built Changes
63	See CADD Users Manual

All Levels below showing Type of info and (color name/color number):

1 CONTROL (VIOLET/5)	2 EXISTING MAN-MADE (YELLOW/4)	3 EXISTING ROADWAY (YELLOW/4)	4 EXISTING VEG & NAT (GREEN/2)	5 EXISTING UTILITY (ORANGE/6)	6 EXISTING HYDRO (BLUE/1)	7 RELIEF & CONTOURS (BROWN/7)	8 SPOT & CTR ELEVATIONS (BROWN/7)
9 PROFILE GRID (RED/3)	10 PLAN SHEET FORMATS (WHITE/0)	11 TERRAIN DTM FEATURES (WHITE/0)	12 COORDINATE GRID (VIOLET/5)	13 RAMP, OC & UC ALIGN. (WHITE/0)	14 RAMP, OC & UC TEXT (WHITE/0)	15 MAIN ALIGNMENT (WHITE/0)	16 MAIN ALIGN. TEXT (WHITE/0)
17 FRONTAGE ALIGN. (WHITE/0)	18 FRONTAGE ALIGN. TEXT (WHITE/0)	19 UNDEFINED	20 PAVEMENT EDGES (WHITE/0)	21 CURBS,DIKES, GUTTERS (WHITE/0)	22 MISC. CONST. DETAILS (WHITE/0)	23 LAYOUT NOTES (WHITE/0)	24 OBLIT & AC RESURFACE (RED/3)
25 TEMP ALIGNMENT (RED/3)	26 UNDEFINED	27 UNDEFINED	28 UNDEFINED	29 EXISTING IRRIGATION (BROWN/7)	30 CUT & FILL DATA (RED/3)	31 EXIST R/W BOUNDARIES (ORANGE/6)	32 NEW R/W FENCES (ORANGE/6)
33 RAW TEXT (ORANGE/6)	34 UNDEFINED	35 UNDEFINED	36 DRAINAGE (BLUE/1)	37 DRAINAGE TEXT (BLUE/1)	38 SANITARY SEWER (VIOLET/5)	39 SANITARY SEWER TEXT (VIOLET/5)	40 NEW UTILITY & TEXT (YELLOW/4)
41 CONTOUR GRADING (VIOLET/5)	42 PAVEMENT ELEVATIONS (WHITE/0)	43 PVMT MKR & STRIPING (RED/3)	44 PVMT MKR & STRIPE TEXT (RED/3)	45 SIGNING (RED/3)	46 CONST. AREA SIGNING (RED/3)	47 ELECTRICAL (WHITE/0)	48 ELECTRICAL TEXT (YELLOW/4)
49 PLANTING & LANDSCAPE (GREEN/2)	50 NEW IRRIGATION (BLUE/1)	51 STAGE 1 CONSTR. (RED/3)	52 STAGE 1 CONSTR.TEXT (RED/3)	53 STAGE 2 CONSTR. (RED/3)	54 STAGE 2 CONSTR.TEXT (RED/3)	55 STAGE 3 CONSTR. (RED/3)	56 STAGE 3 CONSTR.TEXT (RED/3)
57 UNDEFINED	58 SOUNDWALLS (WHITE/0)	59 SOUNDWALLS TEXT (WHITE/0)	60 DRAWING DATA (WHITE/0)	61 HQ CHANGES	62 AS BUILT CHANGES	63 UNDEFINED	

Levels 2-9, & 11 are drop out levels.

Preliminary information or information not currently defined by the Caltrans leveling convention, can be placed on any undefined level, except Level 63.

Color



There are 8 colors that are standard for Caltrans Roadway drawing.

These 8 colors are duplicated and re-numbered to allow an override to the plotting of information either on drop-out or non dropout levels.

Standard	Dropout on Non Dropout Levels	Non Dropout on Dropout Levels	
<u>Color</u>	<u>Color</u>	<u>Color</u>	
0		85	101
1		86	102
2		87	103
3		88	104
4		89	105
5		90	106
6		91	107
7		92	108

Color Ø will display as white in a .dgn file but will be black when plotted out.

Line Weights

Line quality is extremely important to the readability of 11" x 17" prints. Line widths or weights are varied to distinguish certain classes of features from others. The more basic outlining features are emphasized with heavier (wider) lines. Examples are alignment lines, base lines, construction layout lines, and the basic outline of objects. Medium weight lines are used for proposed construction and right of way. Light lines are used for existing topography, dimensioning, and other less important details.



Weight	Feature	Visibility of line
1	Object Lines	Dark, bold and sharp
0	Dimension Lines	Sharp, thin lines
0	Object Center Lines	Sharp, thin lines
1	Hidden Lines	Dark and sharp
0	Station Callout Lines	Dark, sharp and thin lines
1	Right of Way	Dark, sharp and bold
4	Sheet Borders	Heavy, dark and sharp
3*	Alignment Lines for Main Route(s)	Dark, bold and sharp
2*	Alignment Lines for Ramps and Local Streets	Dark, bold and sharp
1	Stationing for all Alignment Lines	Dark, bold and sharp

* Using varying line weights allows the main route alignment to be shown more prominently than secondary alignment lines, which in turn, allows secondary alignment lines to be shown more prominently than the proposed construction lines (edge of pavement, edge of shoulder, median barriers, etc.). If the weight of an alignment line obscures or interferes with proposed construction lines, the weight of the alignment line may be reduced to provide greater clarity of the work to be performed.



Line Codes

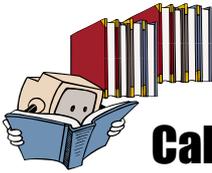
Line codes depict a recognizable pattern used for the majority of object and object definitions. These **Line Codes** should not be confused with **Custom Line Styles** or **Patterned Lines**. There are (8) standard line codes built into the Bentley MicroStation Product and are fixed in size (spacing of dashed lines). Dashed lines are used to distinguish existing from proposed work on non dropout levels.

Line Code	Definition
0	Solid or Continuous line. Used for Objects (not Hidden) and Dimension lines.
1	A Dotted Line (used only for existing features)
2	Short Dashed Line
3	Long Dashed Line (used for depicting hidden details & existing non-structural features)
4	Dash-Dot
5	Medium Dashed Line
6	Dash Dot Dot (Existing Structural Features)
7	Long Dash Short Dash (Object Centerlines)

Linear-Patterning and **Custom Line-Styles** define specific elements in a drawing file, not general types of lines as Line Codes “0” through “7” depict. Depiction of **Guard Railing** and **Sound Walls** are examples of specific **Linear Patterning** and **Custom Line Styles** that display both line style and weight.

Custom Line Styles

Custom Line Styles will replace the need for *Linear Patterning*. To place and display *Custom Line Styles*, the individual workstation (computer) must have the Resource File loaded on it. *Custom Line Styles* are not embedded in the design file, as is the case for cells. The Resource File must be available to display *Custom Line Style* within a design file.



Caltrans Cell Library

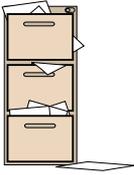
The Standard Cell Library is: “mtcellib.cel”

This is a set of standardized symbols available on ALL Caltrans CADD systems.

The Caltrans Cell Library is made up of cells for 6 functional units, which are as follows:

- Project Plans*
- Roadway Design
- Landscape Architecture
- Traffic Electrical
- Right of Way
- Geometrics

** Standard Sheet formats (borders) are included in the Project Plans cells. See Section 2-1.2A of the Plan Preparation Manual for more detailed information.*



Caltrans Resource Files

The following resource files need to be loaded and configured for everyone working on PS&E projects:

“ctfont.rsc” (Caltrans standard fonts)

“ctlstyle.rsc” (Caltrans standard line styles)

The above listed resource files will be available with the next release of MicroStation (Microstation J) scheduled to be out February 2002.

Table Files



The following table files need to be utilized for PS&E delivery:

ctcolor.tbl (Standard Caltrans Color Table)

fullbw.pen (Pen Table for PS&E Submittal)

File Naming Convention



The CADD file name for each sheet of the project plans shall consist of 10 characters arranged as described herein.

The first character of the file name shall be the designation of the District where construction is to be performed. The designation for Districts 1 through 9 is the corresponding district number (one character only) where the project is located. The designation for District 10 is “a”, for District 11 is “b”, and for District 12 is “c”.

Characters 2 through 6 of the file name shall be the first five digits of the Expenditure Authorization (EA).

Character 7 of the file name shall be the CADD Alpha Code for the sheet types as listed below.

Characters 8 through 10 of the file name shall be the respective sheet numbers for each CADD Alpha Code used in the project.

Example: (District 04 project) - file name for the first sheet of layouts: **412345e001**

Where **4** = District where construction is located

12345 = First five numbers of EA

e = CADD Alpha Code as listed below for layouts

001 = First sheet of the layouts

Example: (District 11 project) - file name for the 105th sheet of drainage: **b12345i105**

Where **b** = District where construction is located

12345 = First five numbers of EA

i = CADD Alpha Code as listed below for drainage

105 = 105th sheet of drainage work

<u>Sheet Type</u>	<u>Sheet ID</u>	<u>Cadd Alpha Code</u>
Title	—	a
Typical Cross Sections	X	b
<i>(formerly used for Standard Plans List)</i>	—	c
Key Map and Line Index	K	d
Layout	L	e
Layout and Profile <i>(with or without superelevation diagram shown)</i>	L	e
Profile <i>(with or without superelevation diagram shown)</i>	P	f
Superelevation Diagram <i>(only superelevation diagram shown)</i>	SE	f
Construction Details	C	g
Temporary Water Pollution Control Plan, Details, and Quantities	WPC	g
Erosion Control Plan, Details and Quantities	EC	g
Contour Grading	G	h
Drainage Plan, Profiles, Details and Quantities	D	i
Sanitary Sewer Plan, Profiles, Details and Quantities	SS	j
Utility Plan and Details	U	k
Transportation Management Plan Details, and Quantities,	TM	l
Stage Construction and Traffic Handling Plan and Detours	SC	l
Traffic Handling Plan <i>(when not included on SC sheet)</i>	TH	l
Detour Plan <i>(when not included on SC or TH sheet)</i>	DE	l
Construction Area Signs	CS	m
Pavement Delineation Plan, Details and Quantities	PD	n
Summary of Quantities	Q	o
Sign Plan, Details and Quantities	S	p
Retaining Wall Plan, Details and Quantities	R	q
Sound Wall Plan, Details and Quantities	SW	r
Roadside Rest Plan	—	s
Plant List, Planting and Irrigation Plan, Details and Quantities*	HP*	t
Signal, Lighting, and Electrical Systems Plan and Details	E	u
Revised and/or New Standard Plan	—	v

* When part of a Highway Project. See CADD Users Manual when project consists of only landscaping work.

Views

Design files with only one view displayed (window 1) is the accepted method by DES-OE for PS&E Submittal. It is no longer necessary to set up 4 additional views (windows 5, 6, 7, 8) as done in the past, but it will still be accepted.



Plotting

Currently the official plotting application to be used is “I PLOT” by Bentley. In MicroStation, the “I PLOT” dialog box is available under **File>I PLOT**.

Creating plot files (.i) for PS&E Submittal:

- 1) Snap to “cut line” when defining plot region. Plot size should equal exactly 34" x 22" (0.8636m x 0.5588m)
- 2) Make sure view looks correct (appropriate levels, fast displays turned off etc.).
- 3) Rotation. The plot view needs to be zero degrees.
- 4) Use Pen Table “fullbw.pen” for PS&E Submittal. Use Pen Table “halfbw.pen” for half size plots.
- 5) One important reason that Caltrans uses a leveling convention is to properly show existing information. Solid (as well as dashed) lines on levels 2-9 and 11 will be plotted as dotted lines.

Use of Raster Image in the PS&E Process



The use of Raster imaging is currently limited to the technology which exists in the CADD Drafting and Plotting industries. Although the raster data is easier to obtain, the import, editing and output of such files in a standard Caltrans format is both complex and time consuming.

Raster Process in PS&E Development

Raster data can be obtained from a number of sources: scanned maps, scanned aerial photography, captured plot file output, and USGS Quad maps, etc.. The development of the project plan sheet can utilize any of these raster images as long as the resultant file is PS&E compatible. The following methods are available and acceptable for PS&E Submittal.

Raster Import

The raster image can be included or *imported* into the MicroStation design plane by selecting the **File > Import > Image** tool within a design file session. Once placed, these images can be sized and repositioned, but not edited. The current plotting solution allows for this type of raster image import.

File → Import → Image < browse to desired image and select >

Follow the on screen instructions to place the image by data point and drag. To move or resize the image, you must first select the image with a data point, and drag from the center or one of the handle points. This type of raster usage may be included in PS&E Submittals as part of the complete design (dgn) file.

Descartes Image Manager

Utilizing the *Descartes Image Manager*, raster images may be placed within the MicroStation design file working plane. These images may be edited using a combination of MicroStation and *Descartes* tools. MicroStation line work, cells and text may be added to the raster image by overlaying the raster image with the vector data and then *stamping* the vector data into the image. Raster data deletions or erasures are made using the *Descartes* Tool Box. Once completed, the image containing all correct sheet border formats and the raster image data, should be saved through Image Manager as a *CCITT* (Comite

Consultatif International Telephonique which is an organization that sets international communication standards) **group 4 Tiff** file. This **Tiff** format sheet can now be used for PS&E Submittal purposes.

Plotted Output to Tiff

Depending on the availability of this feature within the current plotting solution, plan sheets built with raster data (**Descartes**), or **Raster Reference** may be plotted to file and submitted as a **Tiff format** raster image. This completed image file can then be re-edited for DES-OE purposes utilizing the **Descartes Image Manager** tool boxes located within MicroStation, and saved again as a **CCITT group 4 Tiff** image file. Once a completed Tiff image has been created, the current plotting solution allows for the direct submission and plotting of these tiff images either singularly or in batch mode.

Scanned Images... Legacy Plan Sheets

Legacy plan sheets, such as existing Log of Test Borings and As-Built data of existing structure/roadway plans, which are not available as electronic files, may be scanned into raster (Tiff) format and submitted as (Tiff) files for the purposes of establishing a 100% electronic PS&E Submittal.

These scanned images should be imported into a capable raster image editor such as **RxSpotlite**, for the purpose of image clean-up. Crop (image clipped to the extents of the cut-lines... or as close to a finished 22 x 34 inch image as possible but not to exceed 23 x 35 inches), de-skew (rotational correction), and de-speckle (removal of sheet noise) should be performed on all sheet files prior to PS&E Submittal.

This is not a replacement for the submission of MicroStation (dgn) format files, but is a variation which allows the submission of sheets electronically, that were traditionally submitted as Hard-copy.

Conclusion

The use of Raster Reference and Descartes images, falls within the bounds of *reference file attachments*, and therefore are not considered PS&E compliant. The use of these techniques for the creation and building of plan sheet data is encouraged, however, the sheet builder should consider the final product requirements when establishing the PS&E timetable for submission of electronic sheets.

Reference Files

No reference files of any kind will be accepted with the PS&E Submittal. Reference files should be used to facilitate creation of a project only.



PS&E Submittal

Submit all district electronic files to Division of Engineering Services, Office of Office Engineer. Use a PS&E CADD Submittal Form (refer to the Plans Preparation Manual). Include a Project Plans Review Checklist. Fill in all the information on the forms completely and accurately to process project in a timely manner. All electronic files must meet the requirements stated in the PS&E Directory Checklist and the Drafting Plan Review Checklist for the job to be considered “PS&E ready”.

Note: Contact your District Drafting Services Department or CADD support for assistance in the preparation of projects for PS&E Submittal.

Consultant Prepared Projects

Consultant prepared projects must comply with the requirements set forth in the Plans Preparation Manual, CADD Users Manual and this EZ Guide. Some of the typical requirements for submittal of project plans are:

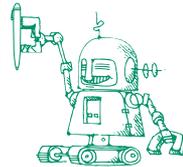
- Files only accepted in MicroStation .dgn format.
- Utilization of Caltrans standardized metric sheet formats (borders).
- Compliance with all prescribed Caltrans text sizes and formats.
- Compliance with Caltrans leveling convention, standard colors, line weights, line codes and file naming convention.
- Conformity to Caltrans plotting standards.

Caltrans Website Resources:

- Caltrans Metric Cell Library
- Caltrans Resource Files

Plan Signatures and Names

Electronic Signatures and Project Plans Development Names



See Section 2-1.2(B) of the Plans Preparation Manual for detailed instructions. See Figures 2-3 through 2-6 of this guide for a ready reference regarding plan signatures and project development names.

Figure 2-3

Title Sheet Signature
(Lower Right Corner of Title Sheet)

(See Note 1)
 (X) PROJECT ENGINEER _____ DATE _____
 REGISTERED CIVIL ENGINEER

(See Note 2)
 No. (See Note 2)
 Exp. (See Note 2)

(See Note 3)
 PLANS APPROVAL DATE _____



CITY OF LOS ANGELES CITY HALL LOS ANGELES, CA 90012	(A) (C)
ABC CONSULTANTS 123 COMMERCE DR. ANY TOWN, CA 90000	(B)
Contract No.	00-000004

(X) JOB TITLE MAY BE USED WITH THE TITLE SHEET SIGNATURE.

GENERAL NOTES:

- a) The title sheet of the project plans shall be signed by the lowest classification licensed person in responsible charge for preparation of the entire project.
- b) Only one seal with associated signature shall appear on the title sheet.
- c) Additional seal, license number and signature of supervisors and managers shall not be placed on the title sheet.

- (A) Where the entire project is financed and prepared by a permittee or agency, the name and address of the firm (permittee) or agency shall be placed in this location on the title sheet.
- (B) Where a consultant prepares the entire project for the firm (permittee) or agency, the firm name and address of the consultant shall be placed in this location.
- (C) Where a consultant prepares the entire project for Caltrans, the firm name and address of the consultant shall be placed in this location.

Only names and addresses of the firm, agency and consultant shall be shown. Do not use logos, telephone numbers, or artwork.

NOTES:

1. Signature and date signed of person in responsible charge for preparation of the entire project. Add date signed (month/day/year, e.g., 4/27/01) on same line and adjacent to signature.
2. Name, Registration Number and License Expiration Date of person whose signature is affixed to this sheet (see Note 1). (FT=2, TX=1.5, WT=1)
3. The Plans Approval Date will be added in DES-0E by Caltrans after all confirmed changes to the plans have been made.

Figure 2-4

**Title Sheet Project
Development Name Block**
(Lower Left Margin of Title Sheet)

Projects Prepared by Caltrans

PROJECT ENGINEER	DATE	PROJECT MANAGER	DATE
①		②	

NOTES:

- ① Printed name of the individual involved in the development of the entire project. The word "Engineer" shall be removed and the appropriate word placed in the name block for non-engineering projects, e.g., Project "Architect".
- ② Printed name of project manager. The title sheet name block may be revised as shown below where the project manager is not the design engineer for the project.

PROJECT ENGINEER	DATE	DESIGN ENGINEER	DATE	PROJECT MANAGER	DATE
①		③		②	

- ③ Printed name of the design engineer.

Projects Prepared by Consultants or Local Agencies
(Revise name block spaces as shown below)

PROJECT ENGINEER	DESIGN OVERSIGHT APPROVAL	REGISTRATION NO.	DATE
④	PRINTED NAME ⑤ SIGNATURE	⑥	

- ⑦ Approved as to Impact on State facilities and conformance with applicable State standards and practices and that technical oversight was performed as described in the California Department of Transportation A & E Consultant Service Manual.

NOTES:

- ④ Printed name of the individual involved in the development of the entire project. The word "Engineer" shall be removed and the appropriate word placed in the name block for non-engineering projects, e.g., Project "Architect".
- ⑤ Printed name and signature in this name block of Caltrans licensed person providing design oversight approval.
- ⑥ Registration number and date of signature of Caltrans licensed person whose signature is in the design oversight approval name block.
- ⑦ Enter this note in the lower left side of the title sheet perpendicular to the bottom portion of the sheet and in proximity of the Title Sheet Project Development Name Block as shown above.

Figure 2-5

Individual Plan Sheet Signature
(Upper Right Corner of Plan Sheet)

DIST	COUNTY	ROUTE	KILOMETER TOTAL	POST PROJECT	SHEET NO.	TOTAL SHEETS
← (See Note 1) →						
(See Note 2)						
REGISTERED CIVIL ENGINEER				DATE		
(See Note 4)						
PLANS APPROVAL DATE						
CITY OF LOS ANGELES						
CITY HALL (A) (C)						
LOS ANGELES, CA 90012						
ABC CONSULTANTS (B)						
123 COMMERCE DR.						
ANY TOWN, CA 90000						
<i>The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.</i>						
<i>Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov</i>						

* If other than CIVIL revise appropriately, e.g., ELECTRICAL, MECHANICAL, LAND SURVEYOR, GEOLOGIST, LANDSCAPE ARCHITECT, BUILDING ARCHITECT (DO NOT USE JOB TITLES).

GENERAL NOTE:

Only one seal and signature of the appropriate licensed person in responsible charge for developing the plan sheet shall be shown on each individual plan sheet.

- (A) Where the work shown on the plan sheet is not financed by Caltrans, but is financed by a permittee or agency, the name and address of the firm (permittee) or agency shall be placed in this location on the plan sheet.
- (B) Where a consultant prepares the plan sheet for the firm (permittee) or agency, the firm name and address of the consultant shall be placed in this location.
- (C) Where a consultant prepares the plan sheet for Caltrans, the firm name and address of the consultant shall be placed in this location.

Only names and addresses of the firm, agency and consultant shall be shown. Do not use logos, telephone numbers, or artwork.

NOTES:

1. For information to be placed in this area, see Section 2-1.2(C).
2. Signature and date signed of person in responsible charge for preparation of the plan sheet. Add date signed (month/day/year, e.g., 4/27/01) on same line and adjacent to signature.
3. Name, Registration Number and License Expiration Date of person whose signature is affixed to this sheet (see Note 2). (FT=2, TX=1.5, WT=1)
4. The Plans Approval Date will be added in DES-0E by Caltrans after all confirmed changes to the plans have been made.

Figure 2-6
Individual Plan Sheet
Development Name Block *
(Left Side of Plan Sheet)

Projects Prepared by Caltrans

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER																			
①	②	CALCULATED/ DESIGNED BY	DATE	REVISED BY																
		CHECKED BY		DATE REVISED																

NOTES:

- ① Enter name of the functional area responsible for development of the plan sheet, e.g., DESIGN, TRAFFIC OPERATIONS, etc. Where one Caltrans District develops the plan sheet for another Caltrans District, the functional area shall be preceded with the preparer's District Number, e.g., 01-DESIGN.
- ② Printed name of person in functional area responsible for development of the plan sheet.
- ③ Printed initials of the person responsible for the work indicated. Use month and year for date.
- * Structure plan sheets have other name block formats.

Projects Prepared by Consultants or Local Agencies

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER																			
④	⑤	CALCULATED/ DESIGNED BY	DATE	REVISED BY																
		CHECKED BY		DATE REVISED																

NOTES:

- ④ No entry is to be made in this name block when the plan sheet is prepared by a consultant or local agency.
- ⑤ If project is developed by consultant or local agencies, the Caltrans person providing the oversight to ensure the plan sheet is designed in accordance with the Department's practices, shall have his/her name printed in this name block space. The words "Project Engineer" shall be removed and replaced with the words "Design Oversight".
- ⑥ Printed initials of the person responsible for the work indicated. Use month and year for date.
- * Structure plan sheets have other name block formats. Sheets will be provided by Caltrans Division of Engineering Services.

[Additional name block shall not be added to the plan sheet formats.]

Abbreviations and Acronyms

- A -		CL	chain link
AB	aggregate base	Cl	class
ABBC	asbestos bonded bituminous coated	Clr	clear, clearance
ABM	air-blown mortar	Co	county
Abn	abandon	Col	column
Abut	abutment	Conc	concrete
AC	asphalt concrete	Cond	conduit
ACB	asphalt concrete base	Conn	connector
ACP	asbestos cement pipe	Const	construct, construction
AFES	alternative flared end section	Coord	coordinate
Ahd	ahead	Cr	creek
Adj	adjust	CRSP	concreted rock slope protection
Alt	alternate	CSP	corrugated steel pipe
AP	alternative pipe	CSPA	corrugated steel pipe arch
APC	alternative pipe culvert	CTB	cement treated base
APU	alternative pipe underdrain	CTPB	cement treated permeable base
AS	aggregate subbase	CTPM	cement treated permeable material
ASRP	aluminum spiral rib pipe	Culv	culvert
Assy	assembly	- D -	
ATPB	asphalt treated permeable base	D	depth
ATPM	asphalt treated permeable material	Dbl	double
Ave	avenue	DD	downdrain
- B -		Del	delineators
BB	beginning of bridge	Det	detour or detail
BC	begin horizontal curve	DF	douglas fir
BCR	begin curb return	DI	drainage inlet
Beg	begin	Dia	diameter
Bit Ctd	bituminous coated	Dist	distance
Bk	back	DMBB	double metal beam barrier
Bkf	backfill	Dr	drive
Bldg	building	DTBB	double thrie beam barrier
Blvd	boulevard	Dwy	driveway
BM	benchmark	- E -	
Br	bridge	EA	each
BVC	begin vertical curve	Ease	easement
BW	barbed wire	EB	end of bridge or eastbound
- C -		EC	end horizontal curve
CAA	cable anchor assembly	ECR	end curb return
CAP	corrugated aluminum pipe	ED	edge drain
CAPA	corrugated aluminum pipe arch	EDC	edge drain cleanout
CAS	construction area sign	EDO	edge drain outlet
C-C	center to center	EDV	edge drain vent
Chnl	channel	Elev	elevation
CIDH	cast-in-drilled-hole	Emb	embankment
CIP	cast iron pipe	EP	edge of pavement
CIPCP	cast in place concrete pipe	Eq	equation
☪	centerline	ES	edge of shoulder

ETW	edge of traveled way		
EVC	end vertical curve	L	length
EW	endwall	LCB	lean concrete base
Exc	excavation	Loc	location
Exist	existing	LOL	layout line
Exp	expressway	Ln	lane
Exp Jt	expansion joint	LS	lump sum
	- F -	Lt	left
F & C	frame and cover		- M -
Fdn	foundation	m	meter or meters
FEBT	facing eastbound traffic	Max	maximum
FNBT	facing northbound traffic	MB	metal beam
FSBT	facing southbound traffic	MBB	metal beam barrier
FWBT	facing westbound traffic	MBGR	metal beam guard railing
FES	flared end section	Med	median
FF	filter fabric	MH	manhole
F & G	frame and grate	Mkr	marker
FG	finished grade	Min	minimum
FH	fire hydrant	Misc I & S	miscellaneous iron and steel
FL	flow line	Misc	miscellaneous
Fr Rd	frontage road	mm	millimeter(s)
Ftg	footing	Mod	modified or modify
Fwy	freeway	Mon	monument
	- G -	MP	metal plate
Ga	gage	MPGR	metal plate guard railing
Galv	galvanized	MR	movement rating
GP	grading plane	Mtl	material
GR	guard railing		- N -
GSP	galvanized steel pipe	NB	Northbound
	- H -	No.	number (must have period)
H	height	NPS	nominal pipe size
h	hour	Ø	nominal diameter
HD	horizontal drain		- O -
Horiz	horizontal	Oblr	obliterate
HP	{ hinge point	OC	overcrossing
	{ horsepower	OD	outside diameter
HS	high strength	OG	original ground
HW	headwall	OGAC	open graded asphalt concrete
Hwy	highway	OH	overhead
	- I -		- P -
IB	imported borrow	PAP	perforated aluminum pipe
ID	inside diameter	PB	pull box
Inv	invert	PC	point of curvature
Irr	irrigation	PCC	{ point of compound curve
	- J -		{ portland cement concrete
JP	joint pole	PCP	perforated concrete pipe
JS	junction structure	PCVC	point of compound vertical curve
Jt	joint	Ped	pedestrian
	- K -	Ped OC	pedestrian overcrossing
km	kilometer (always lower case)	Ped UC	pedestrian undercrossing
KP	kilometer post		

Perm Mtl	permeable material	SG	subgrade
PG	profile grade	SGD	subgrade drain
PI	point of intersection	Shld	shoulder
P/L	property line	Sht	sheet
PL	plate	SI	Internation System of Units
PM	post mile	SM	selected material
PN	paving notch	Spec	special
POC	point of horizontal curve	SPP	slotted plastic pipe
POT	point of tangent	SS	slope stake
POVC	point on vertical curve	SSBM	strap and saddle bracket method
PP	{ power pole plastic pipe	SSD	structural section drain
PPP	perforated plastic pipe	SSPA	stuctural steel plate arch
PPL	preformed permeable liner	SSPP	stuctural steel plate pipe
PRC	point of reverse curve	SSPPA	stuctural steel plate pipe arch
PRF	pavement reinforcing fabric	SSRP	steel spiral rib pipe
PRVC	point of reverse vertical curve	St	street
PSP	perforated steel pipe	STA, Sta	station
PVC	polyvinyl chloride	STBB	single thrie beam barrier
Pvmt	pavement	Std	standard
	- R -	Str	structure
R	radius	Surf	surfacing
RCA	reinforced concrete arch	SW	{ sidewalk sound wall
RCB	reinforced concrete box	Swr	sewer
RCP	reinforced concrete pipe		- T -
RCPA	reinforced concrete pipe arch	T	semi-tangent
R & D	remove and dispose	TAB	tablet
Rd	road	TBB	thrie beam barrier
Reinf	reinforced or reinforcing	Tbr	timber
Rel	relocate	TC	top of curb
Ret	retaining	TCB	traffic control box
RM	road-mixed	Temp	temporary
RP	reference point	TG	top of grate
RR	railroad	TP	telephone pole
R & S	remove and salvage	TPB	treated permeable base
RSP	rock slope protection	TPM	treated permeable material
Rt	right	Trans	transition
Rte	route	TS	{ traffic signal tubular steel
RW	retaining wall	Typ	typical
R/W	right of way	Typ Sec	typical section
	- S -		- U -
SAE	stucture approach embankment	UC	undercrossing
Salv	salvage	UD	underdrain
SAPP	structural aluminum plate pipe	UP	underpass
SB	southbound		- V -
SC	sand cushion	V	{ design speed valve
SL	station line	Var	variable
SCSP	{ Slotted corrugated steel pipe sacked concrete slope protection	VC	vertical curve
SD	storm drain	VCP	vitrified clay pipe
Sec	section		
Sep	separation		

Vert vertical
 Via viaduct
 - W -
 W width
 WB westbound
 WH weep hole
 WM wire mesh
 WSP welded steel pipe
 WV water valve
 WW wing wall
 - X -
 Xing crossing
 X Sec cross section

SI PREFIXES		
SYMBOL	PREFIX	MULTIPLICATION FACTOR
m	milli-	10 ⁻³
k	kilo-	10 ³
M	mega-	10 ⁶
G	giga-	10 ⁹

GENERAL RULES:

1.) Single words should be upper and lower case letters.
 i.e., Misc = miscellaneous

2.) Abbreviations or acronyms that consist of more than one word should be all upper case letters.
 i.e., BCR = begin curb return

(There are a few exceptions to the above rules. See Standard Plan A10A and this guide for specific exceptions.
 i.e., EA = each

METRIC UNITS (SI)	
SYMBOL	UNIT
m	meter
g	gram
s	second
A	ampere
°C	degrees Celsius
Hz	hertz
N	newton
Pa	pascal
L	liter
ha	hectare
W	watt

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